Request for Information: Emergency Response Imagery Service

Geospatial Information Office
California Resources Agency
1416 9th St., Suite 1311
Sacramento, CA 95814
gio@resources.ca.gov

Abstract

In the event of an emergency, first responders and disaster managers need access to the best available imagery products for California. These products are distributed across the State in various databases, administered by various agencies, and with various licensing restrictions. To facilitate emergency access to this imagery, and help define a set of reasonable and useful requirements, the California Geospatial Information Office (GIO) is investigating the creation of an emergency response imagery service. The GIO is requesting information from interested parties regarding four aspects of an imagery service: 1) the imagery service, 2) client architecture and applications, 3) access control strategies to the imagery, and 4) potential pilot projects demonstrating the service.

To further this effort, and to help define a set of reasonable and useful requirements, the GIO is requesting information for specific areas pertaining to an Emergency response imagery service; an imagery service, potential imagery clients, access control for the imagery service, and potential pilot projects to demonstrate the feasibility and utility of such a service.

1 Background

One of the most critical geospatial datasets in any emergency situation is current high-resolution (1-meter or better) ortho-imagery. Geo-referenced imagery provides a foundation for visual identification of the extent and distribution of structures, infrastructure, vegetation, roads, and terrain. Each of these aspects features and their juxtaposition to human-induced emergencies and natural hazards (i.e., fires, floods, earthquakes) affects decision-making by emergency response, mitigation and recovery personnel.

In addition to providing access to detailed one-third-meter urban area imagery collected for Homeland security purposes over the past few years, we anticipate acquiring a statewide one-meter color ortho-imagery collection in summer of 2005, that will be available during the summer of 2006 for use by emergency responders. This dataset will be a major component of the larger corpus of imagery.

It is anticipated that sources for much of the proposed imagery service will be from the existing, and anticipated CaSIL archive data. In addition, integration with other existing state services and infrastructure, including GeoFinder must be considered.

1.1 CaSIL

California Spatial Information Library (CaSIL) is the primary repository within the State Resources Agency for the archiving and dissemination of California imagery products. CaSIL contains about 1TB of imagery, including satellite imagery, USGS digital ortho-corrected quads, and additional imagery at various spatial resolutions and acquisition times. CaSIL primarily deals with datasets that are freely distributed, and CaSIL does not have strong policies in protecting licensed material. In addition to direct downloads, CaSIL also provides access to the imagery data through a number of Internet Map Service (ArcIMS) and the Open Geospatial Consortium, Inc (OGC) Web Map Service (WMS).

1.2 GeoFinder

Geographic Location Finder (GeoFinder) is a tool that helps find and retrieve geographic and environmental data from the California Resources Agency, its constituent boards, departments, conservancies, commissions, and other partner organizations. GeoFinder lets users drill down through a map of California using predefined geographies like zip code, watershed, bioregion, county, urban area or by place name. Once an area of interest is identified, the user can easily locate and retrieve digital ortho-photo quads

and scanned USGS map sheets for the area. GeoFinder will also describe standard methods for identifying spatial locations within California.

2 Imagery Server

The GIO is interested in providing a single point of access to a statewide archive of imagery data. The minimum technical requirements for the imagery service are as follows:

- Should support many simultaneous clients. Should be extensible.
- Should be robust to lost or intermittent Internet connectivity.
- The imagery corpus or selected parts of the corpus should be able to be replicated locally or regionally.
- Should be conservative of file storage space and bandwidth.
- A number of acquisition options should be available, including:
  - Bulk downloads
  - "clip and ship" functionality
  - Provide web services to multiple clients
  - Provide potential for secure data upload and exchange during an event.
- Should provide address geo-location services. Should provide geo-location services on other named regions; such as: mile post marker, rail post marker, place name, township/section/range, county, city, zipcode, watershed.
- Investigate and clarify the feasibility of using open standards compliant services and tools to connect clients to the imagery service.

To the extent possible, besides support for emergency response, the Imagery service should provide support for access and acquisition of data for more general purposes.

3 Imagery Clients

It is expected that there is a large range of client capabilities, and that the service will support an equipment range from a GIS technical class workstation, to a desktop PC in an Emergency operation center, to a field deployed laptop or hand-held PDA. Questions regarding client applications and solution elements include:

- What range of services should an imagery client perform?
- How would clients communicate with the service?
- How much localized image caching could or should be performed by the client?
- Can multiple client applications be deployed accessing the same service?
- How can an imagery service client be incorporated into existing methods of practice for emergency response?
- Will some/all of the client systems be capable of draping imagery onto digital elevation maps? Will they be capable of incorporating vector layers like road networks?
- Should clients have the capability to coincidentally track the location of users in an operational area via GPS?

4 Access Control

Requirements for access control should include:

- A "web of trust" allowing timely access for local responders should be included.
- Service should support access to datasets with multiple and different types of availability and licensing restrictions.
- A centralized authority has the ability to add data providers into the service.
- An extensible method to provide controlled access to imagery beyond what will be provided via a password protected FTP site.

5 Pilot Projects

The GIO is also interested in partnering with any interested parties in terms of developing a pilot project to demonstrate key features of the imagery service. This might involve participation in joint grant proposals or participation in industry sponsored projects.

- Discuss what parts of the imagery service are to be demonstrated. At a minimum, the pilot should include services with a capacity to handle a collection of most recent high (1 m) to very high (0.1 m) resolution imagery for California.

- Provide an architectural framework for the pilot project, and the required technologies.
- Discuss potential partners for evaluating the merits of the system. For example partnerships with California State stakeholders in emergency operations would help define operational objectives, and deployment strategies.
- Discuss how the project might interface with the existing CERES enterprise architecture. An example might be how the pilot would integrate with *GeoFinder* to provide a navigational framework for users.
- Discuss how this pilot project might be integrated in a partner agency's emergency response exercise or migrated into a production facility.

Pilot projects should subsidize or minimize hardware, software, installation and configuration costs for the GIO over the duration of the pilot project.

6 Response

Responses to this Request for Information (RFI) should be sent electronically to the "California Geospatial Information Office (GIO)" <gio@resources.ca.gov> by September 19, 2005.

Specific questions regarding this RFI can be sent to the GIO by COB August 22, 2005. Based on these questions, an update RFI may be issued by August 31, 2005.

A response to this RFI can contain comments on any or all of the four components identified above. More general comments on the topic are also encouraged, though they must pertain specifically to the emergency imagery service. PDF is the preferred submission format.

There are no limits on the organizations that can respond to the RFI. All contributions are voluntary. By accepting a response, the GIO makes no agreement with the responder regarding the use of comments in the submission. By submitting this RFI, the GIO makes no guarantees on any subsequent Request for Proposals (RFP) or further action on this project.

Submission of proprietary information is discouraged, and should only be included if a previous arrangement with the GIO has been made. Documents with proprietary information should clearly designate the document as such.

Post RFI on GIO Website	August 1, 2005
Clarifications	August 22, 2005
RFI update	August 31, 2005
Responses due	September 19, 2005